

PROGRESS IN UNRAVELLING THE GEOLOGIC HISTORY OF VENUS

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The Magellan mission collected Venus data from the start of radar mapping in mid September, 1990 until October, 1994, when the spacecraft was maneuvered into a lower orbit and caused to plunge into the atmosphere to provide data on Venus's upper atmosphere. The four year mission provided 12011) resolution images of more than 98% of the planet, with many areas mapped up to three times. Altimeter mapping provided global topography, roughness, and radio properties. Radio tracking of the spacecraft in the close circular orbit achieved by aerobraking the spacecraft, provided a global gravity field that is revealing the interior density distribution. The gravity observations allow studies of features as small as a few hundred km across. Systematic geologic mapping has begun using all the Magellan data. Geologic mapping at 1:5,000,000 scale is integrating observations of surface characteristics and geophysical inferences drawn from topography and gravity. Venus is not as geologically active as Earth and has had a different evolutionary history. The generalized history depicts Venus as tectonically violent during an early and unknown epoch. A relatively brief period dominated by volcanism may have occurred some 300 to 1000 m years ago. This was followed by a relatively quiet period up to the present with scattered volcanism, wind activity, and impact. This paper presents the range of geologic hypotheses for Venus that have emerged since the Magellan mission.

SUBMITTAL INFORMATION

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